2013 Horseshoe Lake – MerRouge Aquatic Vegetation Control Plan

LDWF, Inland Fisheries

1. Waterbody type – Inactive oxbow lake formed by impoundment from Bayou Bonne Idee. The levee construction forming the current lake was completed in 1947.

2. Age and condition of control structure – Constructed in 1947, inoperable; the structure needs to be replaced.

3. Type of control structure – 3 ft. x 3 ft. concrete drop box with manually operated slide gate (size unknown) (Figure 1).

Figure 1. Horseshoe Lake control structure at 2.5 ft. below pool stage.

4. Water level range (MSL) – Pool stage = 90.4 ft, annual fluctuation typically < 2.5 ft.

5. Surface area – 133 acres, no significant change with annual fluctuation

6. Average depth – 4.5 ft.

7. Watershed ratio – unknown, less than 10:1

8. Drawdown potential of structure – n/a

9. Waterbody Board or Lake Commission – Morehouse Parish Police Jury (MPPJ) currently has authority on water control issues. The Horseshoe Lake Commission, which was appointed by the Police Jury, has been disbanded since the late 1990's.

    a. Primary contact information – Morehouse Parish Police Jury, phone (318) 281-4132

b. Procedure for spillway openings – operated by the MPPJ under technical assistance of the Louisiana Department of Wildlife and Fisheries (LDWF).

No drawdowns have been conducted on the lake to date.

Significant stakeholders and needs/concerns
- Farmers – minimal agricultural irrigation
- Homeowners – stable water levels, vegetation control, aesthetics

History of aquatic vegetation complaints
There have been periodic complaints from homeowners whenever nuisance vegetation has become excessive or is impacting private piers. Most of the historic complaints have been attributed to the floating species water hyacinth (*Eichhornia crassipes*) and duckweed (*Lemna sp.*). The police jury has requested assistance in the past with clearing floating and emergent aquatic vegetation, mostly alligator weed (*Alternanthera philoxeroides*) and water hyacinth from the area around the spillway structure.

Controversial issues on the lake
A 50 year lease between landowners of the current lake bottom and LDWF expired on May 23, 1997. The lease agreement established Horseshoe Lake as a state Fish and Game Preserve. Soon before the lease was to expire, the Horseshoe Lake Commission, homeowners, and local anglers expressed concern over the possibility of the lake becoming unavailable to the public. The lease has not been renewed, but the lake has remained open to the public. The single boat launch on the lake is also privately owned, but has remained opened to the public, with the owner collecting a modest launch fee.

In 1993, the Lake Commission proposed a drawdown of the lake for repair of the leaking water control structure. The lake had reached levels over 2 ft. below pool stage. Lakeside residents overwhelmingly opposed this drawdown and the effort was abandoned. The structure has remained inoperable.

Aquatic Vegetation Status:

2012
Throughout 2012, there was a minimal amount of nuisance vegetation on Horseshoe Lake. Alligator weed and duckweed were the most abundant species, though neither reached problematic levels. A moderate and desirable amount of coontail was also present in the shallow areas of the lake. No formal vegetation survey was conducted in 2012, though spray crews visited the lake on multiple occasions to monitor the nuisance vegetation

Predicted coverage for 2013
Because of herbicide applications in 2012 and numerous frosts, the coverage of floating and emergent vegetation on Horseshoe Lake is not anticipated to be problematic, though routine herbicide applications will most likely be necessary.

Limitations:

- Factors that may limit the effectiveness of chemical, mechanical, or biological control methods for the aquatic plant problems found in the waterbody.

    - Agricultural and residential irrigation may preclude the use of certain herbicides
    - Water control structure is inoperable
    - Small watershed may prolong drawdowns

- Regulatory or public factors or anything else that may limit the ability of LDWF to control aquatic plant problems in the waterbody.

    - Application of the herbicide 2,4-D would require a waiver from LDAF between March 15 - Sept. 1.
    - The lake bottom, surrounding property, and boat ramp are privately owned, although public access is permitted by the owner of the boat ramp. If public access were to be denied, involvement of LDWF would become limited.

Past Control Measures:

Historic

Applications of commonly used aquatic herbicides (2,4-D, diquat dibromide, and glyphosate) have been made by LDWF with boat mounted spray equipment. In the past, applications were made when infestations of nuisance vegetation became abundant in the lake. The majority of these efforts were for control of duckweed and water hyacinth.

Recent

In 2003, LDWF applied Sonar® (fluridone), a broad spectrum systemic herbicide, into Horseshoe Lake primarily for control of duckweed, but also for coontail (*Ceratophyllum demersum*) control. At the time, over 80% of the lake had been covered with duckweed. The treatment resulted in a vast reduction in total coverage of duckweed. By 2005, it had returned to problematic levels. Environmental conditions and repeated applications of the contact herbicide diquat dibromide had reduced duckweed to more tolerable levels in the lake. Typically, only maintenance herbicide applications are conducted on Horseshoe Lake. These applications involve a spray crew making no more than one trip per month during the growing season for control of nuisance vegetation including alligator weed and the previously floating species. Glyphosate (0.75 gallons/acre) and diquat dibromide (90.75 gallons/acre) have been primarily used for emergent species and on duckweed and water hyacinth. These herbicides have been used most often because 2,4-D is restricted in this area for much of the growing season. No herbicide applications were necessary in 2011.

In 2012, few herbicide applications were required for management of nuisance vegetation. Alligator weed and duckweed were the two most commonly treated species, with 36 and 32 acres sprayed in 2012, respectively. Duckweed was treated with diquat dibromide. Alligator weed was treated with glyphosate. A small amount of pennywort (*Hydrocotyle sp.*) was also

treated with glyphosate. The treatments were considered routine maintenance applications.

Recommendations:

Regularly scheduled treatments (1 spray crew day/month) during the growing season will be continued to maintain nuisance vegetation at minimal levels. Public complaints and requests from the MPPJ will be responded to as soon as possible. The following herbicides are to be applied by boat spray crew: diquat dibromide (0.75 gallons/acre) for control of duckweed and other floating or emergent species, glyphosate (0.75 gal/acre) for control of alligator weed and other emergent species, and 2,4-D (0.5 gallons/acre) for control of water hyacinth outside of the 2,4-D waiver period.

Typemap:

No detailed type maps have been performed on Horseshoe Lake. An LDWF report in 2005 described aquatic vegetation in the lake. General observations of coverage and potential problems were included. The report stated that moderate amounts of the following species were found adjacent to the shoreline in much of the lake: alligator weed, water primrose (*Ludwigia sp.*), water pennywort (*Hydrocotyle sp.*), and duckweed. The coverage of these species was not problematic. Submergent vegetation was also not posing a threat at this time. Coontail and fanwort (*Cabomba caroliniana*) were observed in moderate amounts scattered throughout the lake.